**CS108L Computer Science for All**

**Week 4: Computer Science Concepts**

**Computational science**

The intersection of math, computer science and science.

**Computational science cycle**

Involves 5 steps

* Select Real world problem
* Simplify to make a working model (abstraction)
* Formulate a mathematical or algorithmic model
* Translate the model into computer code
* Run simulations using the computer model as the test bed
* Evaluate and draw conclusions from the data generated from the model. Interpret if the model is accurate – does it represent the real world.

**Agent Based Models**

A tool for studying complex adaptive systems. These models consist of agents environments and the interactions between agents and other agents and agents and the environment.

**Observer Agent**

An agent in the NetLogo world. It sets up and gives instruction to the other agents in the NetLogo world but has no position and does not move.

**Three phases of an agent based model**

* Setup – create the world
* Runtime loop – agents go through their behavior and change their states and the environment and screen is updated.
* Exit – quit or runs to termination

**Continuous Probability Distribution**

Each value has an equal probability of being used. An example is rolling a single dice.

**Random walk**

A type of turtle movement that sets the heading of the turtle to be a random direction between 0 and 360 degrees. The probability of motion in any direction is uniform; a continuous probability distribution is used..

**Triangular Probability Distribution**

The sum of two continuous distributions (like rolling two dice). The middle value is most likely and the probability decreases as you move away from the middle value.

**Wiggle Walk**

A type of turtle movement that models the movement of a larger animal. The wiggle walk involves the use of a random right and a random left turn in the same step. The resulting probability distribution for the direction of the turtle is a triangular probability distribution center around zero, i.e. the turtle tends to move straight.

Hypothesis

Method- what is the control. Change variables- diff length.

Changing the environment to test. What are the different variables. What if we do not change anything. Base line- sand

Petrolium

Extra Credit

Stop to a certain procedure

Automate

Data in command button